REMARKS

This document is submitted in reply to the final Office Action dated November 13, 2009 ("Office Action").

Applicants have amended claims 6 and 9 to merely promote clarity. Support for the amendments appears in the Specification at page 7, line 13-18. No new matter has been introduced.

The amendments should be entered as they raise no new issues that will require further consideration or search and also do not touch the merits of the application within the meaning of 37 C.F.R. § 1.116(b).

Claims 1, 2, 4, 6, 7, and 9 are pending and under examination. Applicants respectfully request that the Examiner reconsider this application in view of the following remarks.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 6, 7, and 9 are rejected for indefiniteness. See the Office Action, page 2, lines 8-10. Claims 7 and 9 each depend from claim 6.

In particular, the Examiner contends that claim 6 is unclear as it recites a first heat-treatment at 400°C to 900°C and a first heat-treatment temperature reaching 700°C.

Applicants have amended claim 6 by deleting "up to 700°C." In view of this amendment, a skilled artisan would understand that the temperature of the first heat-treatment is between 400°C and 900°C and is not required to reach 700°C.

Applicants therefore respectfully submit that amended claim 6, as well as claims 7 and 9 both depending from it, is definite.

Rejection under 35 U.S.C. § 103

Claims 1, 2, 4, 6, 7, and 9 are rejected for obviousness on one of two grounds. Applicants address each ground separately below.

I

Claims 1, 2, and 4 are rejected for being obvious over Kang et al., US Patent No. 5,650,129 ("Kang") in view of Duraiswami, US Patent No. 6,616,873 ("Duraiswami"). See the Office Action, page 3, lines 8-10. Independent claim 1 will be discussed first.

Claim 1 covers a method of fabricating a porous silica sphere in which a silica gel is heat-treated in a **rotary** tube furnace.

Kang teaches a method of fabricating silica balls, each having a porous inner structure surrounded by a dense outer layer so that it has a low density between 0.05 and 1.5 g/cm^3. See column 1, lines 14-18. The density of a ball is preferably 0.1-0.4 g/cm^3, allowing it to float on water. See column 2, lines 23-29. Clearly, the purpose of the Kang method is to obtain silica balls having a very low density. Kang also teaches that the silica balls are heat-treated in a crucible or, by extension, in a **stationary** furnace.[1] See column 3, lines 1-7. Indeed, the Examiner acknowledged that Kang does **not** teach or suggest using a **rotary** tube furnace, as required by claim 1. See the Office Action, page 8, lines 9-10.

Applicants now turn to Duraiswami. This reference teaches a process of preparing macroporous ceramic spheres having a high crush strength. See column 2, lines 49-52. As correctly pointed out by the Examiner, this process features use of a **rotary** tube furnace. See the Office Action, page 4, lines 8-11. To demonstrate the importance of using a rotary tube furnace instead of a stationary furnace to improve certain properties (in particular, crush strength), the values of certain properties of spheres obtained by using a rotary tube furnace were compared with those of spheres obtained by using a stationary furnace. See Table 9 and accompanying text, column 8, lines 30-62.

The Examiner proceeds to conclude that "it would have been obvious to one of ordinary skill in the art [] to modify the method of Kang [] with the heat-treatment in a rotary tube furnace of Duraiswami [] for the benefit of optimizing physical properties of the resulting spheres." See the Office Action, page 4, lines 11-14. Thus, it appears to be

[1] A crucible has structural features that render it unsuitable for rotation.

her position that, in view of Duraiswami, a skilled artisan would have used a **rotary** tube furnace instead of a **stationary** furnace in the Kang method to obtain silica balls of low density. Applicants disagree.

The comparative density values, as described in Duraiswami, indicate that the **density of spheres increased** when a rotary tube furnace, instead of a stationary one, was used. See column 8, Table 9, "pellet density (gm/cc)." In view of these teachings, a skilled artisan would have understood that using a rotary tube furnace produces spheres having a **higher density**. It follows that he or she would not have modified the Kang method by using the rotary tube furnace as taught in Duraiswami, as doing so would have rendered this method unsatisfactory for its intended purpose, i.e., obtaining silica balls of a very low density.[2] Thus, contrary to the Examiner's assertion, a skilled artisan would not have been motivated to modify the Kang method by using the rotary tube furnace as taught in Duraiswami, thereby arriving at the method of claim 1.

Applicants would like to point out that the law is well established that "[i]f proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." See MPEP § 2143.01.

For the reasons set forth above, Applicants respectfully submit that claim 1 is not rendered obvious by Kang in view of Duraiswami. Nor are claims 2 and 4, which both depend from claim 1.

II

Claims 6, 7, and 9 are rejected for being obvious over Kang in view of Dobson et al, US Patent No. 4,392,988 ("Dobson") and Duraiswami. See the Office Action, page 5, lines 3-5.

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[2] Kang teaches that silica balls having a density of 0.1 g/cm^3 instead of 0.93 g/cm^3 were obtained from the same composition by reducing the heating rate from 120°C per hour to 60°C per hour. See column 3, lines 1-22. This teaching clearly indicates that the heating conditions should be optimized in order to obtain silica balls having a low density in the preferred range of 0.1-0.4 g/cm^3. In other words, these conditions should be optimized to reduce the density, not increase it. As Duraiswami reports that density increased in a rotary furnace, instead of in a stationary one, a skilled artisan would not have been motivated to modify the Kang method by using a rotary furnace.

Claim 6, as amended, covers a method for fabricating a porous silica sphere using at least two **rotary** furnaces.

As discussed above, Kang does **not** suggest using a **rotary** tube furnace, let alone using at least two rotary tube furnaces.

Turning to Dobson, it teaches a method of treating activated alumina. See column 6, lines 1-13. Dobson teaches heat-treatments in at least two chambers. See column 5, lines 9-17. In other words, Dobson uses at least two **stationary** chambers, not at least two rotary tube furnaces. Thus, Dobson, like Kang, does not suggest using at least two rotary tube furnaces, as required by the method of amended claim 6.

As also discussed above, contrary to the Examiner's assertion, a skilled artisan would not have been motivated to modify the Kang method by using the rotary tube furnace as taught in Duraiswami.

As (1) Kang and Dobson do not suggest using a rotary tube furnace and (2) Duraiswami does not provide motivation to modify the Kang method by using a rotary tube furnace, Applicants respectfully submit that amended claim 6 is not rendered obvious by these three references, either taken alone or in combination. Nor are claims 7 and 9, which both depend from claim 6.

CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment.

In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fee is believed due at this time. Please apply any other charges or credits to Deposit Account No. 50-4189, referencing Attorney Docket No. 76303-003US1.

Respectfully submitted,

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